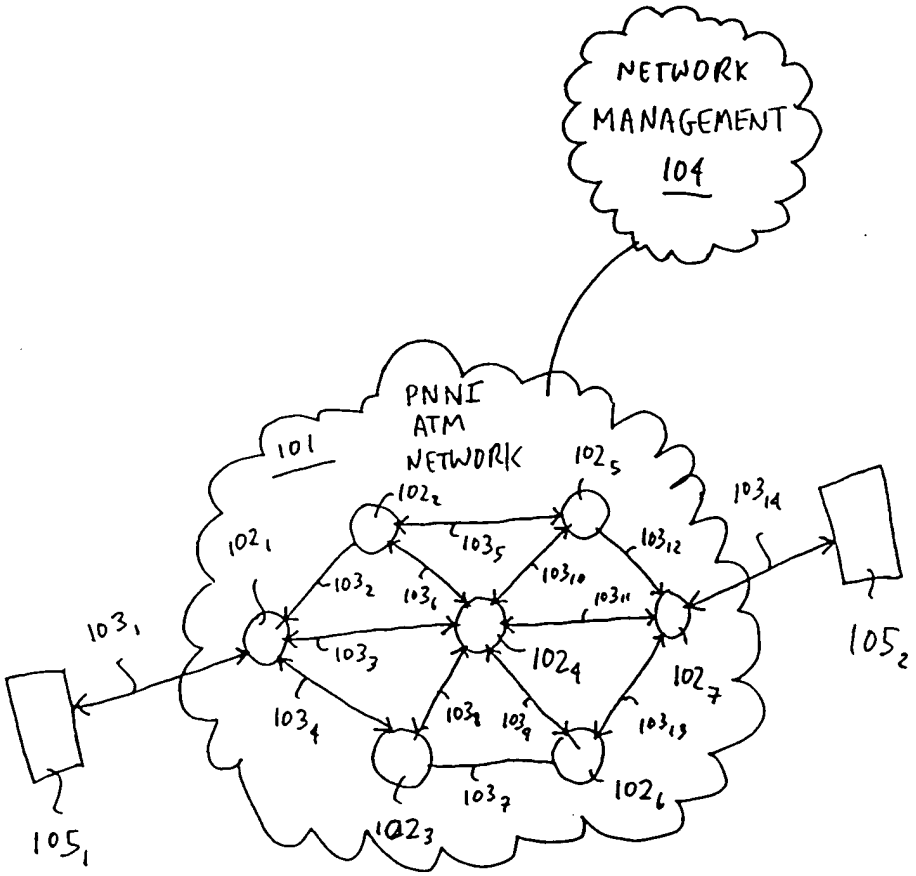

NETWORK
MANAGEMENT
104
PNNI
ATM
NETWORK
101
102_1
102_2
102_3
102_4
102_5
102_6
102_7
103_1
103_2
103_3
103_4
103_5
103_6
103_7
103_8
103_9
103_{10}
103_{11}
103_{12}
103_{13}
103_{14}
105_1
105_2

FIGURE 1

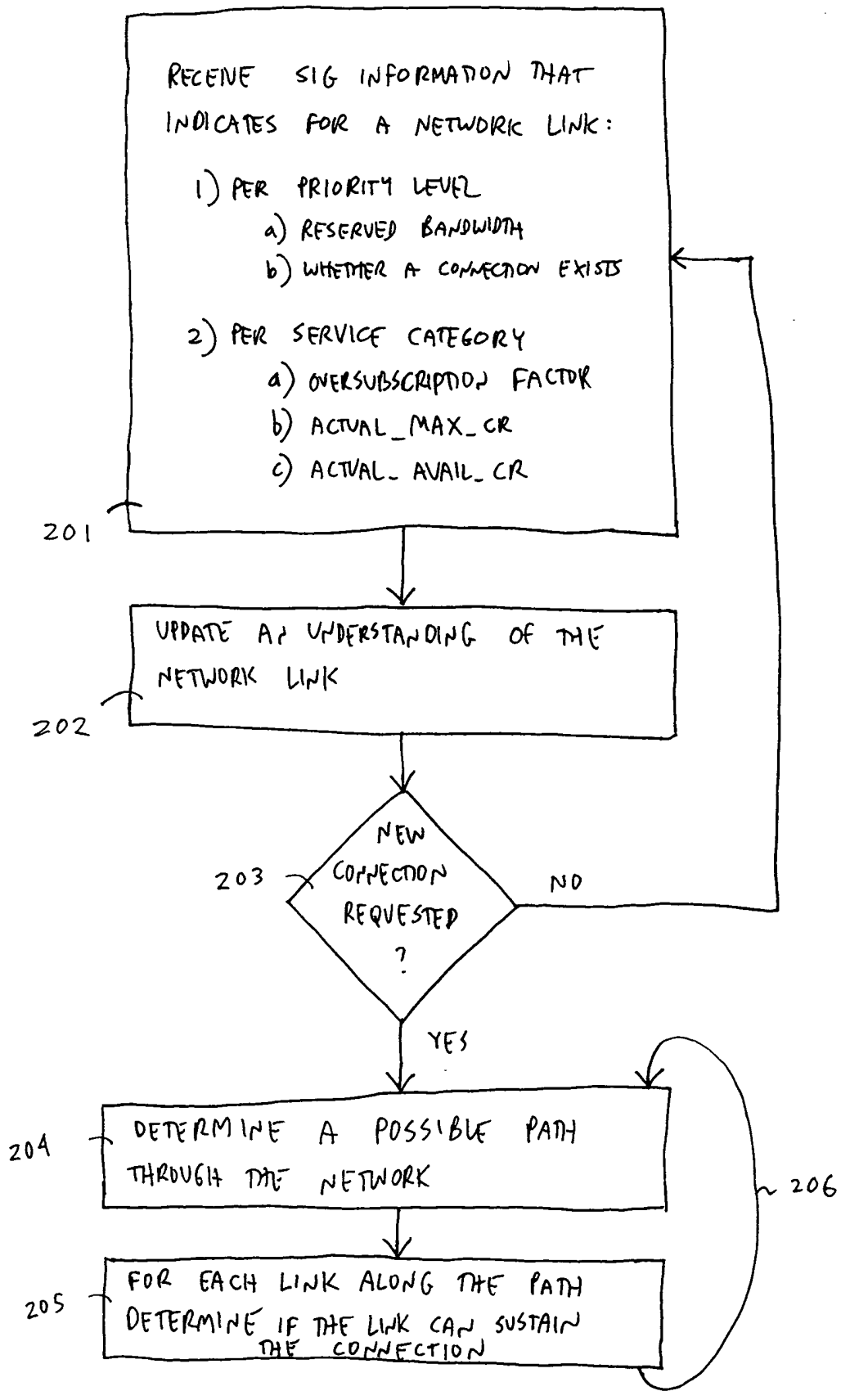

RECEIVE SIG INFORMATION THAT INDICATES FOR A NETWORK LINK:
1) PER PRIORITY LEVEL
a) RESERVED BANDWIDTH
b) WHETHER A CONNECTION EXISTS
2) PER SERVICE CATEGORY
a) OVERSUBSCRIPTION FACTOR
b) ACTUAL_MAX_CR
c) ACTUAL_AVAIL_CR
201
UPDATE AN UNDERSTANDING OF THE NETWORK LINK
202
NEW CONNECTION REQUESTED ?
203
NO
YES
DETERMINE A POSSIBLE PATH THROUGH THE NETWORK
204
FOR EACH LINK ALONG THE PATH DETERMINE IF THE LINK CAN SUSTAIN THE CONNECTION
205
206

FIG. 2

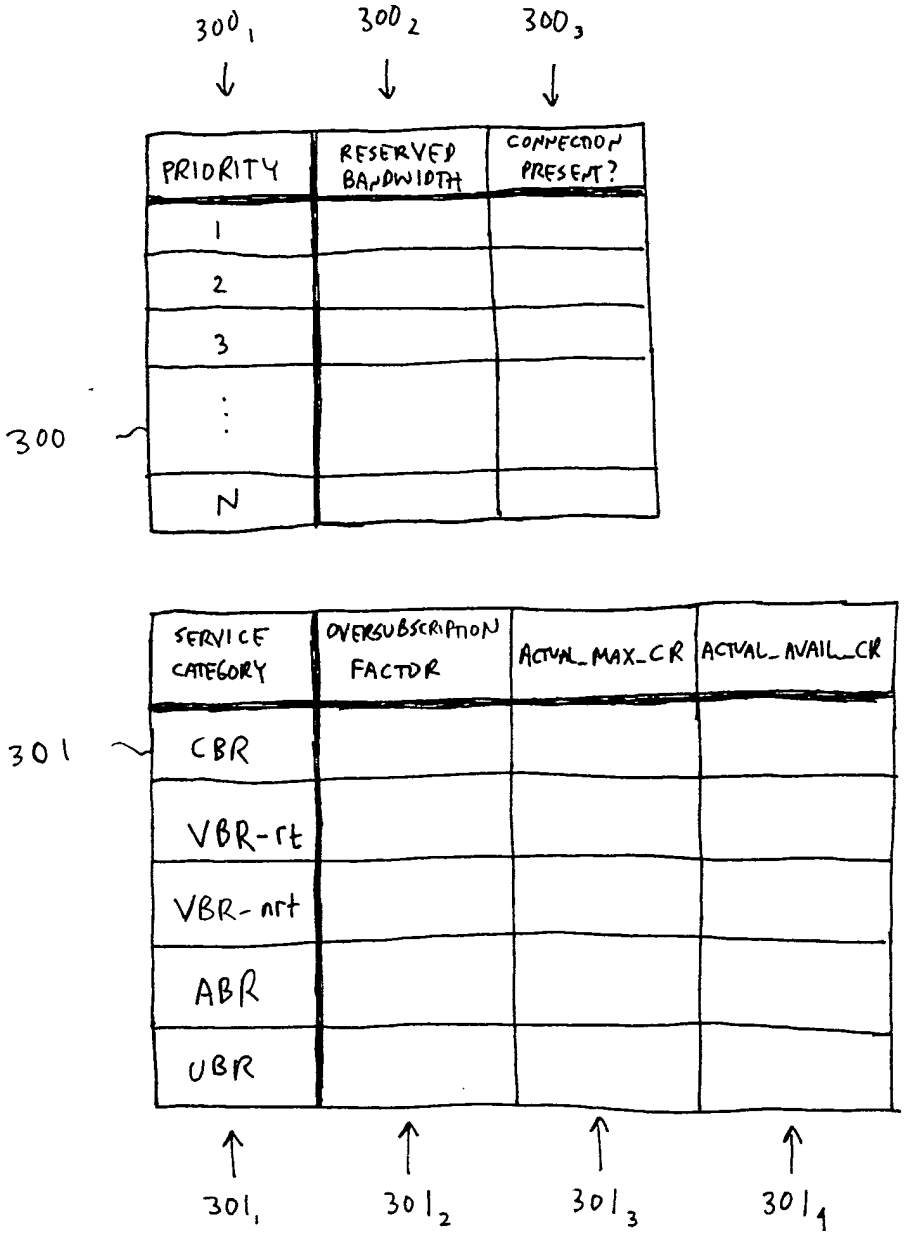

300 1
300 2
300 3
PRIORITY
RESERVED BANDWIDTH
CONNECTION PRESENT?
1
2
3
N
300
SERVICE CATEGORY
OVERSUBSCRIPTION FACTOR
ACTUAL_MAX_CR
ACTUAL_AVAIL_CR
CBR
VBR-rt
VBR-nrt
ABR
UBR
301
301 1
301 2
301 3
301 4

FIG. 3

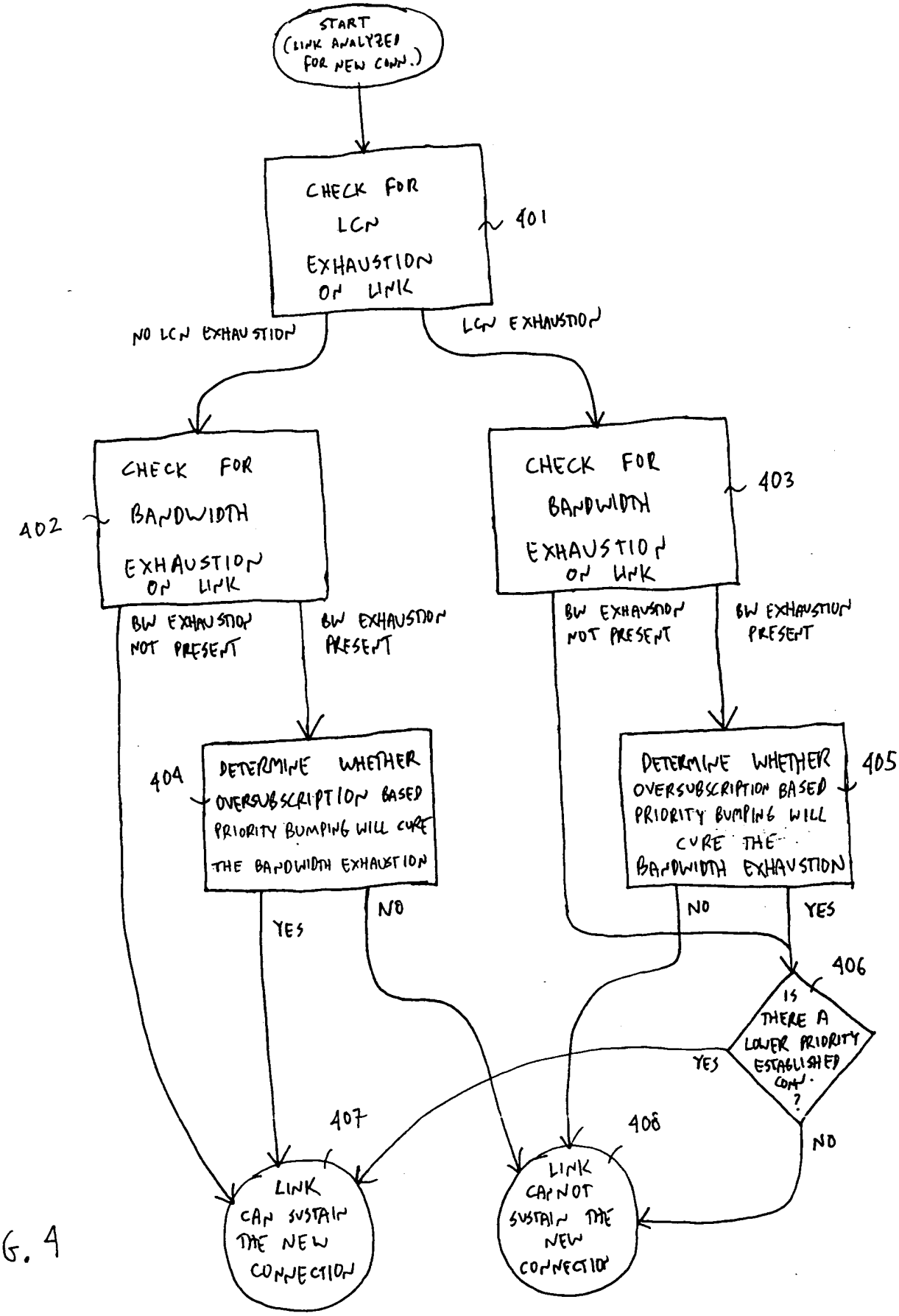

START (LINK ANALYZED FOR NEW CONN.)
CHECK FOR LCN EXHAUSTION ON LINK
401
NO LCN EXHAUSTION
LCN EXHAUSTION
CHECK FOR BANDWIDTH EXHAUSTION ON LINK
402
CHECK FOR BANDWIDTH EXHAUSTION ON LINK
403
BW EXHAUSTION NOT PRESENT
BW EXHAUSTION PRESENT
BW EXHAUSTION NOT PRESENT
BW EXHAUSTION PRESENT
DETERMINE WHETHER OVERSUBSCRIPTION BASED PRIORITY BUMPING WILL CURE THE BANDWIDTH EXHAUSTION
404
DETERMINE WHETHER OVERSUBSCRIPTION BASED PRIORITY BUMPING WILL CURE THE BANDWIDTH EXHAUSTION
405
YES
NO
NO
YES
IS THERE A LOWER PRIORITY ESTABLISHED CONN. ?
406
YES
NO
LINK CAN SUSTAIN THE NEW CONNECTION
407
LINK CANNOT SUSTAIN THE NEW CONNECTION
408

FIG. 4

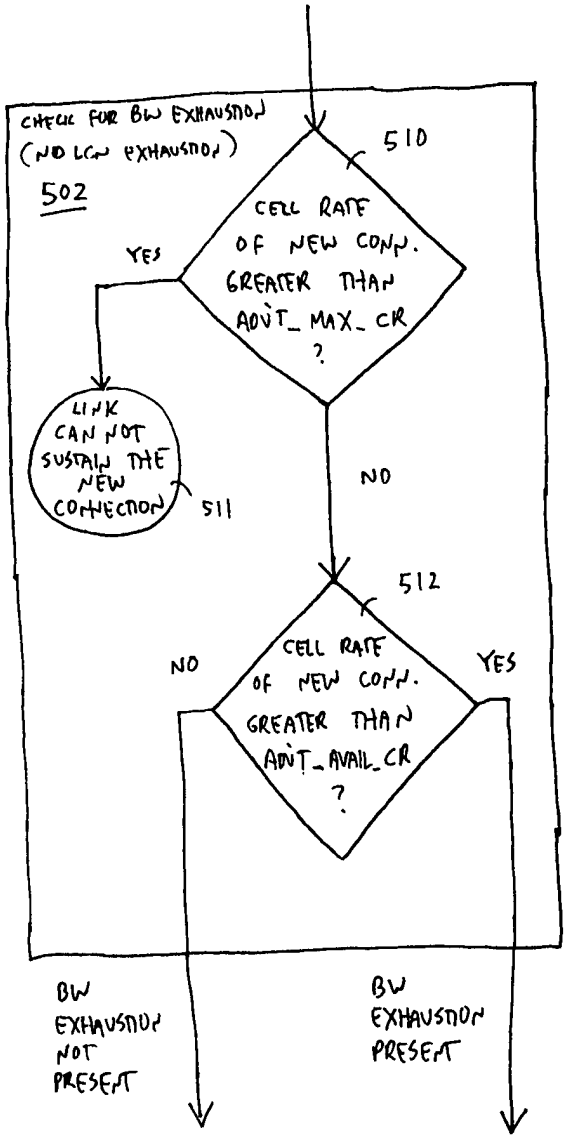

CHECK FOR BW EXHAUSTION
(NO LCN EXHAUSTION)
502
510
CELL RATE OF NEW CONN. GREATER THAN ADVT_MAX_CR ?
YES
NO
LINK CAN NOT SUSTAIN THE NEW CONNECTION
511
512
CELL RATE OF NEW CONN. GREATER THAN ADVT_AVAIL_CR ?
NO
YES
BW EXHAUSTION NOT PRESENT
BW EXHAUSTION PRESENT

FIG. 5A

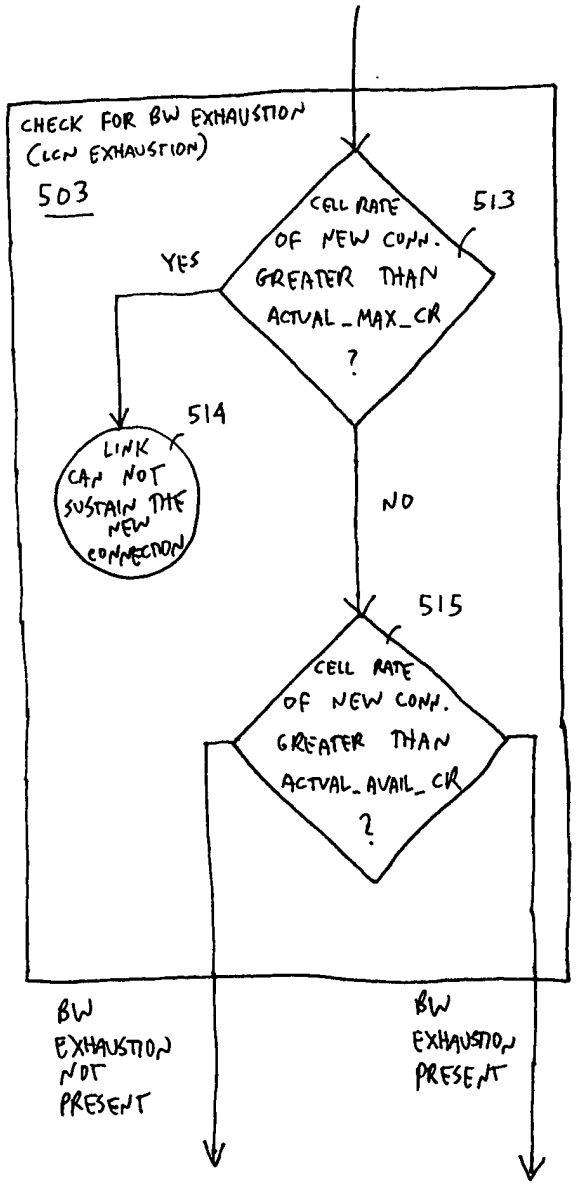

CHECK FOR BW EXHAUSTION
(LCN EXHAUSTION)
503
513
CELL RATE OF NEW CONN. GREATER THAN ACTUAL_MAX_CR ?
YES
NO
514
LINK CAN NOT SUSTAIN THE NEW CONNECTION
515
CELL RATE OF NEW CONN. GREATER THAN ACTUAL_AVAIL_CR ?
BW EXHAUSTION NOT PRESENT
BW EXHAUSTION PRESENT

FIG. 5B

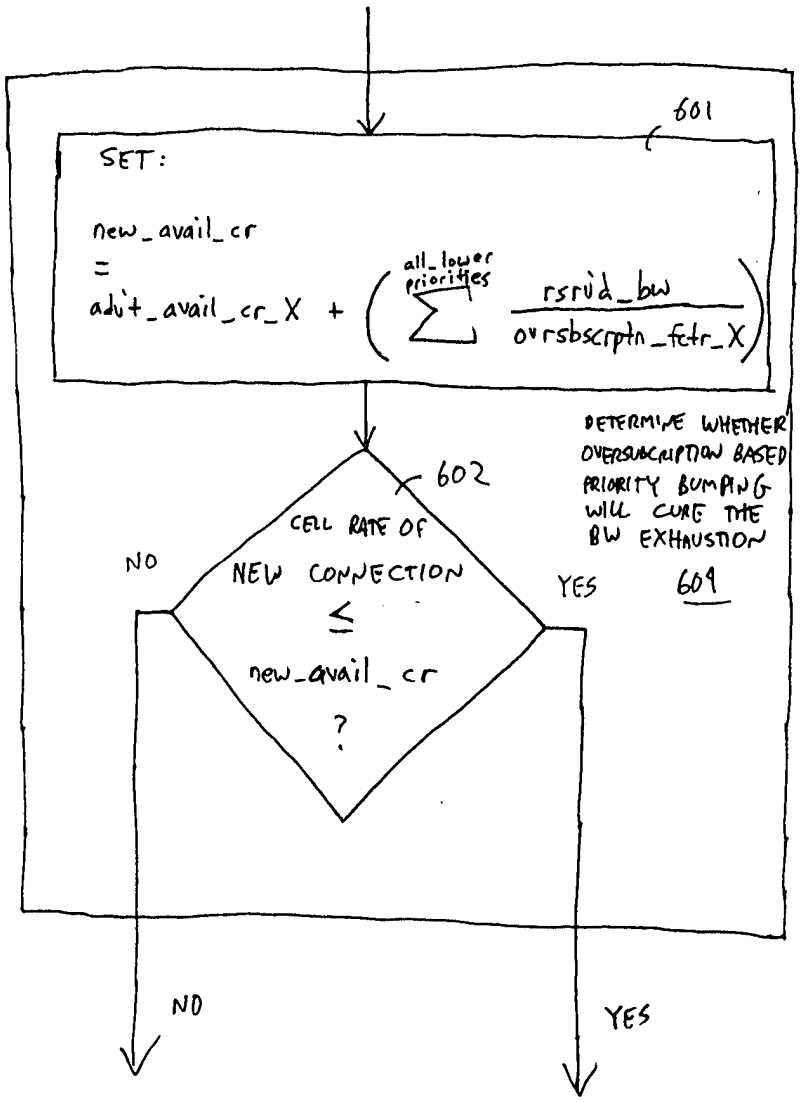

601
SET:
new_avail_cr
=
adjt_avail_cr_X + (Σ all_lower priorities rsrvd_bw / oversbscrptn_fctr_X)
602
CELL RATE OF NEW CONNECTION ≤ new_avail_cr ?
NO
YES
DETERMINE WHETHER OVERSUBSCRIPTION BASED PRIORITY BUMPING WILL CURE THE BW EXHAUSTION
609
NO
YES

FIG. 6A

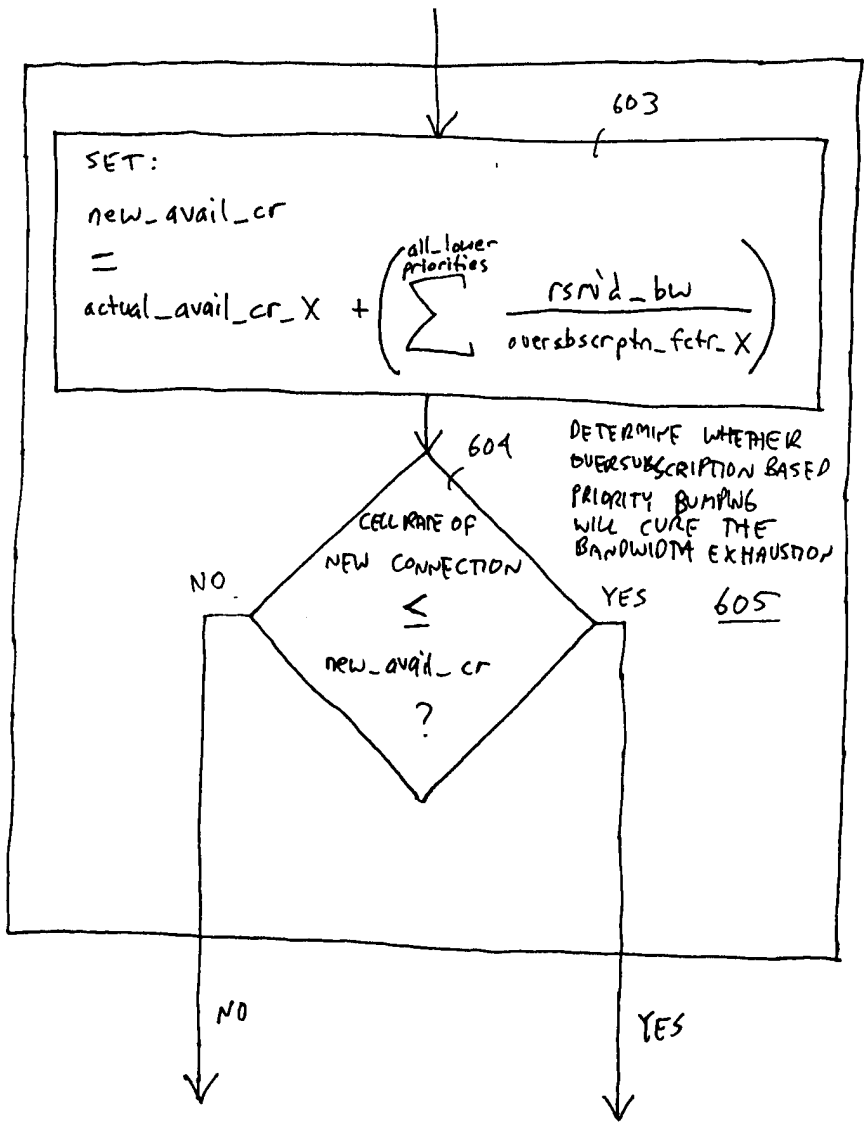

603
SET:
new_avail_cr
=
actual_avail_cr_X + (Σ all_lower priorities rsrvd_bw / oversbscrptn_fctr_X)
604
CELL RATE OF NEW CONNECTION ≤ new_avail_cr ?
NO
YES
DETERMINE WHETHER OVERSUBSCRIPTION BASED PRIORITY BUMPING WILL CURE THE BANDWIDTH EXHAUSTION
605
NO
YES

FIG. 6B

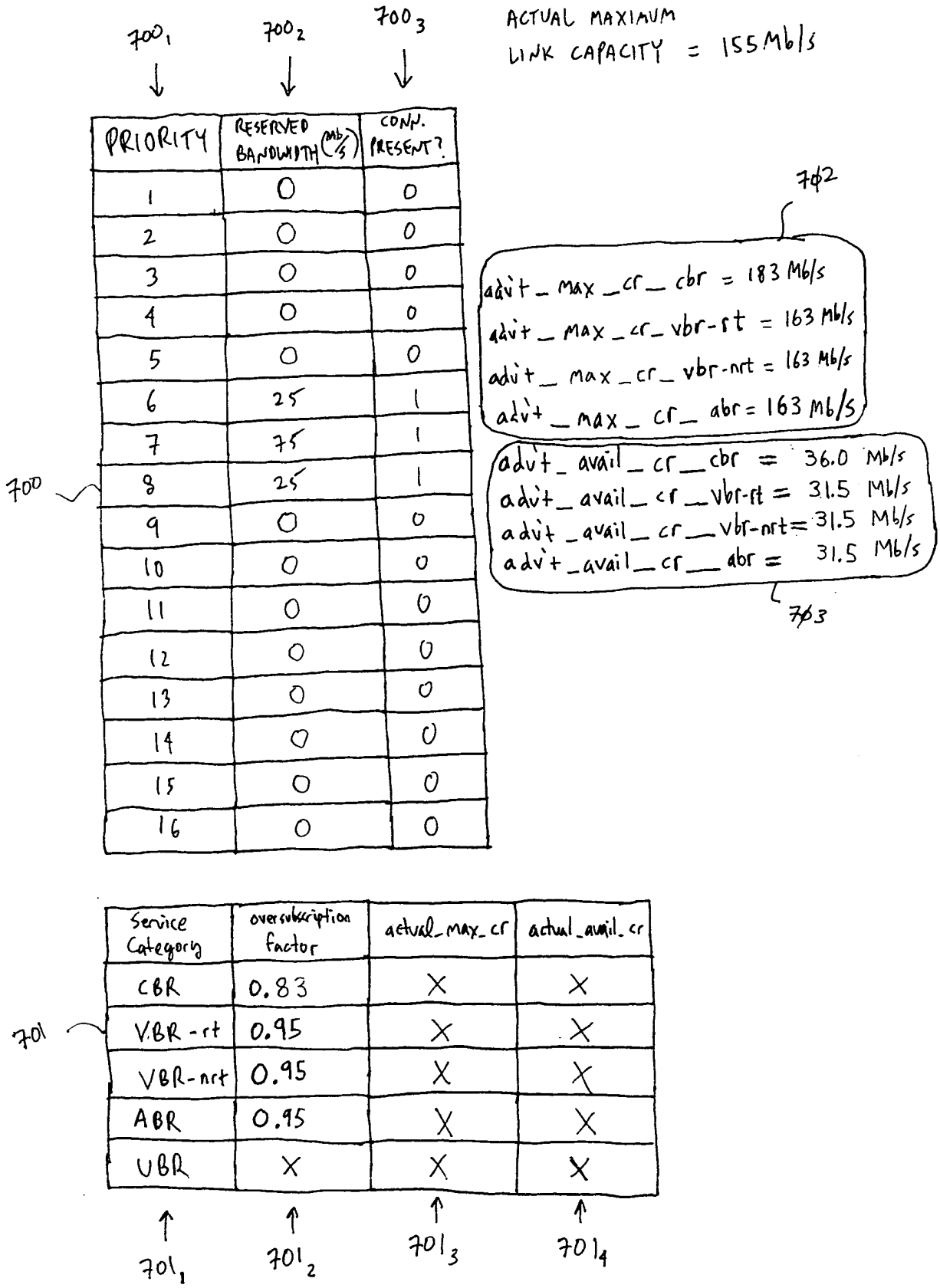
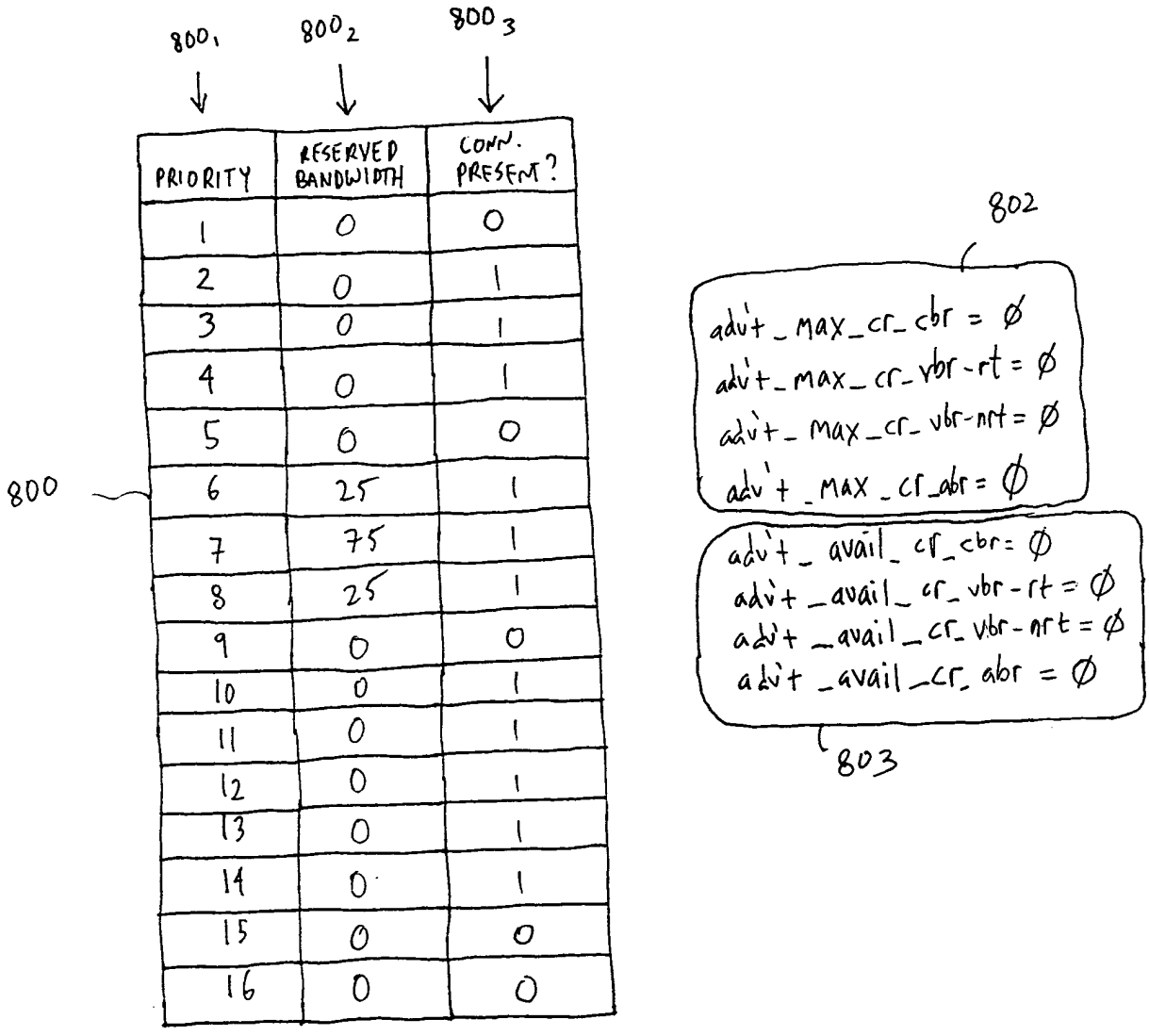

700₁
700₂
700₃
ACTUAL MAXIMUM LINK CAPACITY = 155 Mb/s
PRIORITY
RESERVED BANDWIDTH (Mb/s)
CONN. PRESENT?
1 0 0
2 0 0
3 0 0
4 0 0
5 0 0
6 25 1
7 75 1
8 25 1
9 0 0
10 0 0
11 0 0
12 0 0
13 0 0
14 0 0
15 0 0
16 0 0
700
702
adv't_max_cr_cbr = 183 Mb/s
adv't_max_cr_vbr-rt = 163 Mb/s
adv't_max_cr_vbr-nrt = 163 Mb/s
adv't_max_cr_abr = 163 Mb/s
adv't_avail_cr_cbr = 36.0 Mb/s
adv't_avail_cr_vbr-rt = 31.5 Mb/s
adv't_avail_cr_vbr-nrt = 31.5 Mb/s
adv't_avail_cr_abr = 31.5 Mb/s
703
Service Category
oversubscription factor
actual_max_cr
actual_avail_cr
CBR 0.83 X X
VBR-rt 0.95 X X
VBR-nrt 0.95 X X
ABR 0.95 X X
UBR X X X
701
701₁
701₂
701₃
701₄

FIG. 7



PRIORITY	RESERVED BANDWIDTH	CONN. PRESENT?
1	0	0
2	0	1
3	0	1
4	0	1
5	0	0
6	25	1
7	75	1
8	25	1
9	0	0
10	0	1
11	0	1
12	0	1
13	0	1
14	0	1
15	0	0
16	0	0

801

Service Category	oversubscription factor	actual_max_cr	actual_avail_cr
CBR	0.83	183 Mb/s	36.0 Mb/s
VBR-rt	0.95	163 Mb/s	31.5 Mb/s
VBR-nrt	0.95	163 Mb/s	31.5 Mb/s
ABR	0.95	163 Mb/s	31.5 Mb/s
UBR	X	X	X

801₁ 801₂ 801₃ 801₄

FIG. 8

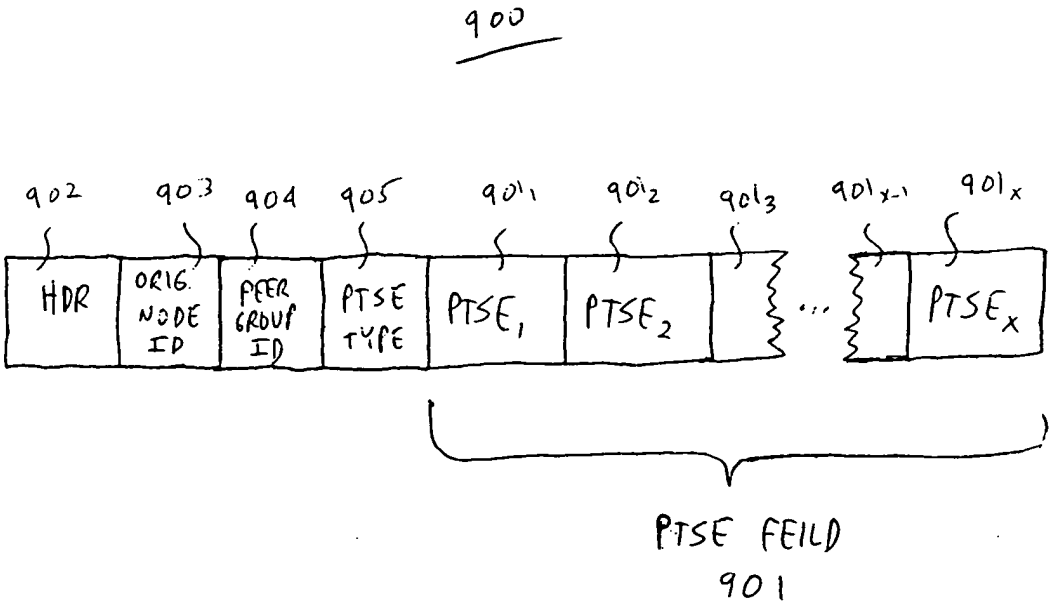

900
902
903
904
905
901 1
901 2
901 3
901 x-1
901 x
HDR
ORIG. NODE ID
PEER GROUP ID
PTSE TYPE
PTSE 1
PTSE 2
PTSE x
PTSE FEILD
901

FIG. 9

1001

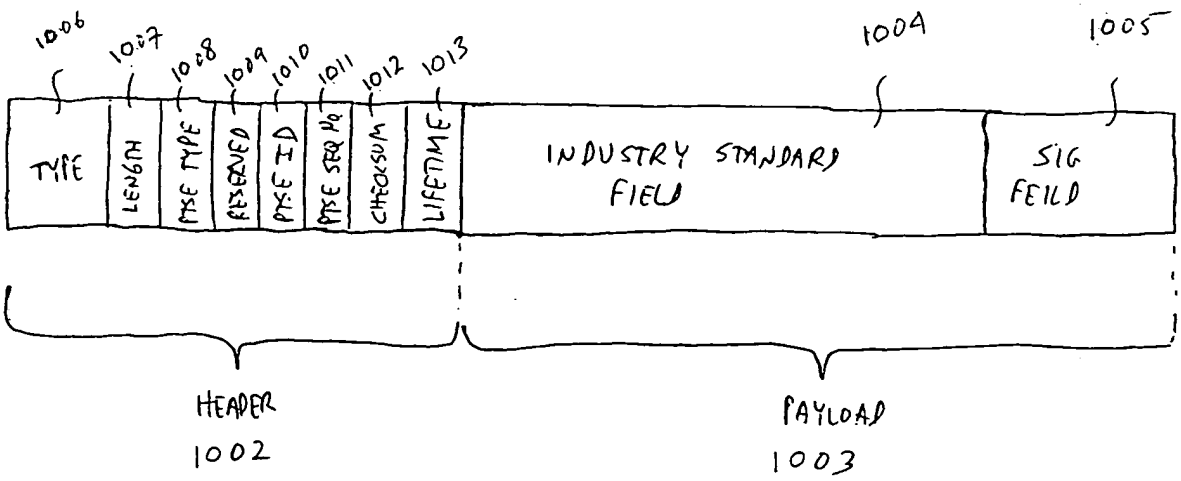

1006
1007
1008
1009
1010
1011
1012
1013
1004
1005
TYPE
LENGTH
MSE TYPE
RESERVED
MSE ID
MSE SEQ NO
CHECKSUM
LIFETIME
INDUSTRY STANDARD FIELD
SIG FEILD
HEADER
1002
PAYLOAD
1003

FIG. 10

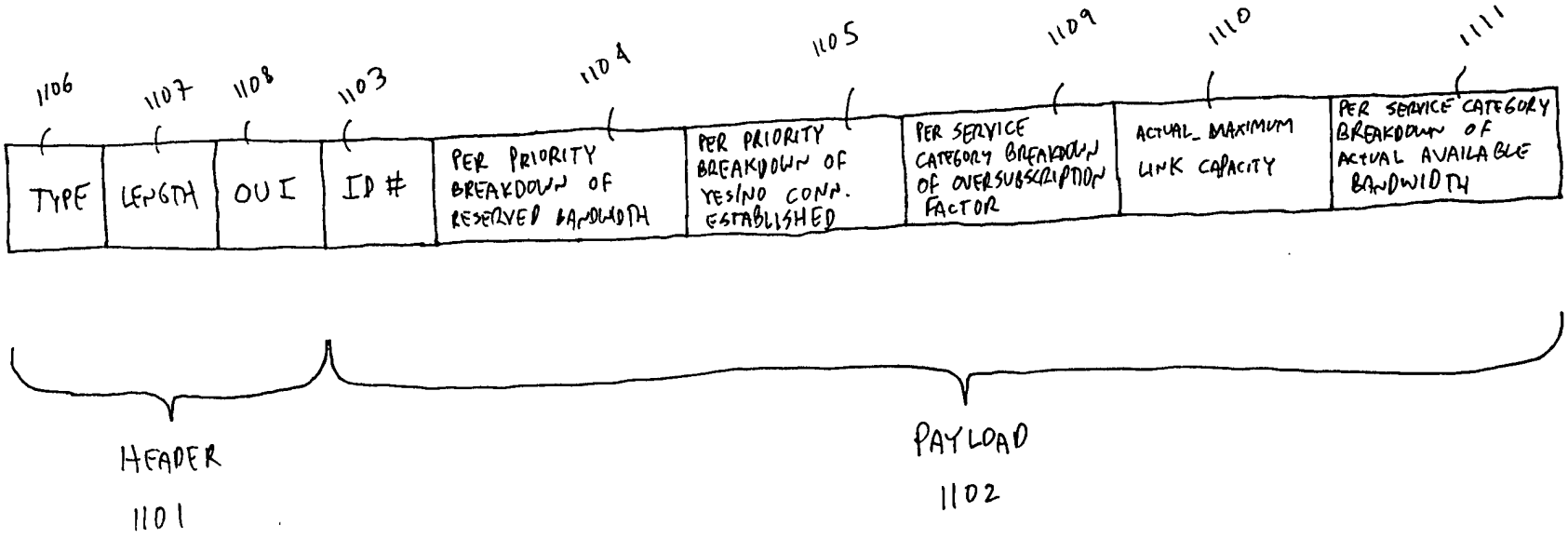

1106
1107
1108
1103
1104
1105
1109
1110
1111
TYPE
LENGTH
OUI
ID #
PER PRIORITY BREAKDOWN OF RESERVED BANDWIDTH
PER PRIORITY BREAKDOWN OF YES/NO CONN. ESTABLISHED
PER SERVICE CATEGORY BREAKDOWN OF OVERSUBSCRIPTION FACTOR
ACTUAL_MAXIMUM LINK CAPACITY
PER SERVICE CATEGORY BREAKDOWN OF ACTUAL AVAILABLE BANDWIDTH
HEADER
1101
PAYLOAD
1102

FIG. 11

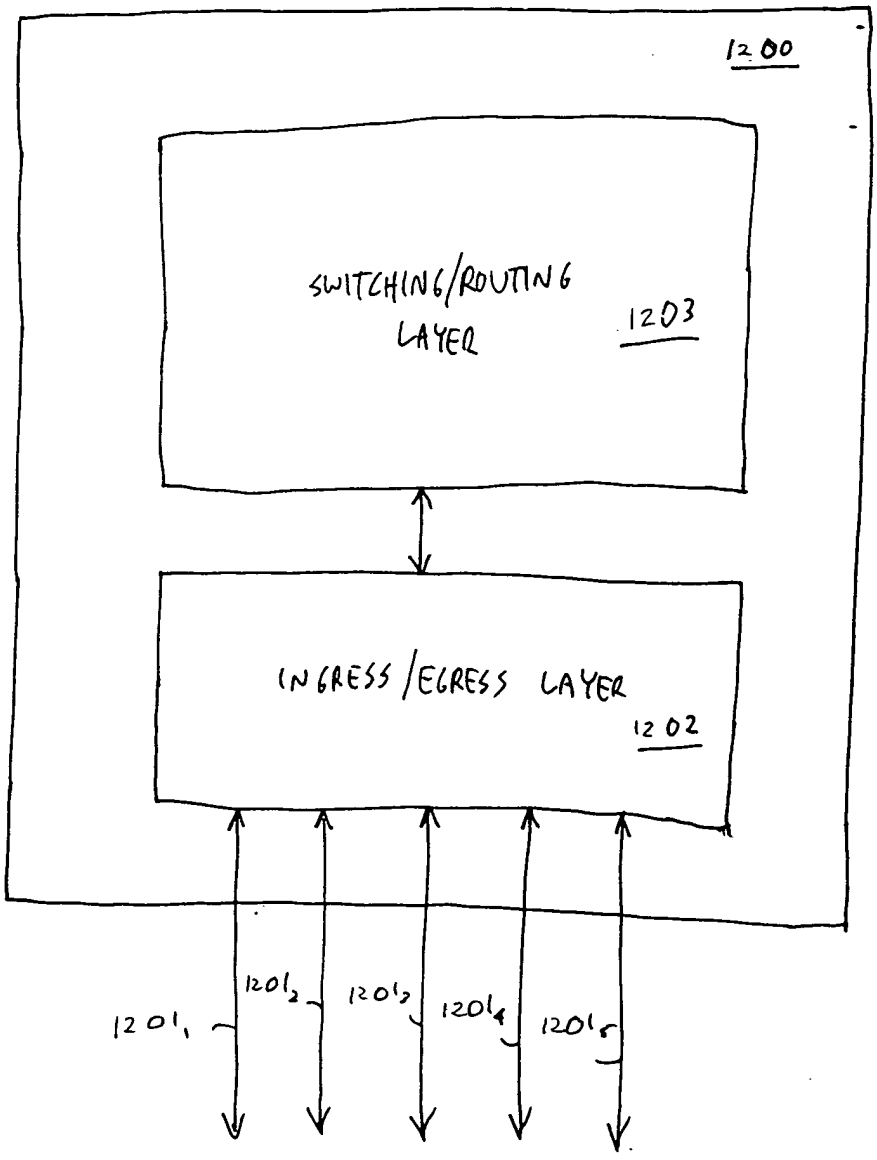

1200
SWITCHING/ROUTING LAYER
1203
INGRESS/EGRESS LAYER
1202
1201₁
1201₂
1201₃
1201₄
1201₅

FIGURE 12